



Developing a scale for the perception of health and complaints/symptoms in hemodialysis patients: turkish version

Hemodiyaliz hastalarında şikayet/semptomlar ve sağlık algılaması için ölçek geliştirme: türkçe versiyon

Developing a scale in hemodialysis patients

Bahar Vardar Inkaya¹, Sezgi Cinar Pakyuz²

¹Department of Nursing, Yıldırım Beyazıt University Faculty of Health Sciences, Ankara, ²Department of Nursing, Celal Bayar University, Manisa School of Health, Manisa, Turkey

Öz

Amaç: Bu çalışma, hemodiyaliz hastalarının semptomlarını belirlemek ve sağlık algılarını değerlendirebilmek için geçerli ve güvenilir bir ölçek geliştirmek amacıyla planlandı. **Gereç ve Yöntem:** Çalışma verileri, araştırmacı tarafından geliştirilen Hemodiyaliz Hastalarında Sağlık Algı Ölçeği (HHSAÖ) ve Hemodiyaliz Hastalarında Semptom-Şikayetler Ölçeği (HHSŞÖ) kullanılarak elde edildi. Çalışmaya 205 kronik hemodiyaliz hastası alındı. Veriler, araştırmacı tarafından hastalarla yüz yüze görüşülerek toplandı. **Bulgular:** HHSAÖ beş maddelik likert tipi bir ölçektir ve 10 maddeden oluşur. Ölçeğin Cronbach alfa güvenilirlik katsayısı 0.79'dur. HHSŞÖ, beş maddelik likert tipi bir ölçektir ve 22 maddeden oluşur. Ölçeğin Cronbach alfa güvenilirlik katsayısı 0.83'tür. **Tartışma:** Bu sonuçlara dayanarak, HHSAÖ ve HHSŞÖ geçerli ve yüksek güvenilirlik düzeyine sahiptir. Hemodiyaliz merkezlerinde hasta şikayetlerini en aza indirmek ve sonuçlara göre gerekli hemşirelik bakımını planlamak ve uygulamak için HHSAÖ ve HHSŞÖ ölçeklerinin kullanılması önerilmektedir.

Anahtar Kelimeler

Şikayet; Hemodiyaliz Semptomları; Güvenirlik; Ölçek; Geçerlik

Abstract

Aim: This study was planned to determine the symptoms of hemodialysis patients and to develop a validated and reliable scale to evaluate health perceptions. **Material and Method:** The study data were obtained using a through patient introduction form developed by the investigator: The Scale for Perception of Health in Hemodialysis Patients (SPHHP) and the Scale for Complaints-Symptoms in Hemodialysis Patients (SCSHP). The study sample included 205 chronic hemodialysis patients. The data were collected by face-to-face interviews with the patients, which were conducted by the investigator. **Results:** SPHHP is a five-point Likert-type scale and consists of 10 items. The scale's Cronbach's alpha reliability coefficient was 0.79. SCSHP is a five-point Likert-type scale and consists of 22 items. The scale's Cronbach's alpha reliability coefficient was 0.83. **Discussion:** Based on these results, SPHHP and SCSHP are valid and have a high level of reliability. We recommended using SPHHP and SCSHP scales, which were developed with a holistic approach because there was an absence in the literature in hemodialysis centers in order to minimize patient risks and to plan and implement required nursing care based on the results.

Keywords

Complaints; Hemodialysis Symptoms; Reliability; Scale; Validity

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Corresponding Author: Bahar Vardar Inkaya, Department of Nursing, Yıldırım Beyazıt University Faculty of Health Sciences, Ankara, Turkey.

T.: +90 3123241555 E-Mail: bahar_inkaya@yahoo.com.tr

Introduction

Chronic kidney disease is defined as kidney damage due to reduced glomerular filtration rate (GFR) and renal function for at least three months [1,2]. Renal Replacement Therapy (RRT) is used in the treatment of Chronic Kidney Disease. One of these treatments is hemodialysis. Approximately half of chronic kidney patients entering hemodialysis experience many physical, psychological and social complaints such as fatigue, sleeping problems, muscle cramps, changes in bowel habits, appetite disorder, sexual dysfunction and social life. All these complaints disrupt the quality of life of patients [3,4,5]. A multidisciplinary approach is needed to control these symptoms and complaints. For this reason, the multidisciplinary approach, the nurse has a great responsibility to ensure patient care continuity and intra-team collaboration [2].

In recent studies, it has been determined that nurse-centered management has a positive effect on chronic diseases [6,7,8,9]. One of the significant effects of the nurse-led programs was that the patient-centered motivational approach resulted in a behavior change in the patient and the family and that adjustment was easier. Apart from that, chronic kidney disease helps the patient to feel less discomfort, reduce anxiety, better accommodate dietary-fluid restrictions, and increase patient self-esteem and quality of life [7]. In a study on dialysis and fatigue, the nurse's counseling about how to cope with the patient's fatigue and how to use the support systems was taught, and this reduced fatigue levels of the patients [8]. As demonstrated in the literature, nurse-based training or programs have helped to reduce or control the symptoms and complaints of patients. From this point, this study was planned to determine the symptoms of hemodialysis patients and to develop a validated and reliable scale to evaluate health perceptions.

Materials and Methods

Design, Setting, Period of Study

The study was conducted between March 2013 and December 2013 at three private dialysis centers providing hemodialysis therapy in Ankara, Turkey. The dialysis centers employed in the study provides service in three sessions on Mondays, Wednesdays, and Fridays, and in two sessions on Thursdays and Saturdays. The average number of patients were between 100-120.

Sample

The study sample included 205 chronic hemodialysis patients who were eligible for the study criteria. The inclusion criteria for the study were to be under hemodialysis therapy for at least 6 months, to be between the ages of 18-65 years, to speak Turkish, to be literate, not to have any communication or mental problems and to accept participating in the study. The exclusion criteria were to be diagnosed with any psychiatric diseases, having any hearing, speaking, or mental problems. The data were collected by face-to-face interviews with the patients, which were conducted by the investigator. The average duration of data collection was 20-25 minutes for each patient.

Measure

The study data were obtained using a through patient introduction form (includes sociodemographic characteristics) devel-

oped by the investigator: the Scale for Perception of Health in Hemodialysis Patients (SPHHP) and the Scale for Complaints-Symptoms in Hemodialysis Patients (SCSHP).

In the present study, an item pool was first created with SPHHP and the SCSHP based on the information in the literature review [1,2,3,4,5,6,7,8,9]. interviews and the knowledge and experiences of the researchers. The validity and reliability analyses were then performed for these draft scales consisting of 35 items.

SPHHP, which can be used in hemodialysis patients, consists of a single factor and ten questions. SCSHP, another scale that can be used in hemodialysis patients, consists of a single factor and 22 items. The scales are a five-point Likert-type scale with never, rarely, occasionally, usually, and always. Never is scored with "1" point and always as "5" points. There is no reverse-scored item. The scales do not contain a cut-off score. With higher scores, the perception of health becomes poorer, and the risk level increases in SPHHP scale. With higher scores from the scale, the complaints and symptoms increase, and accordingly the risks for the patient also increase in SCSHP scale.

Ethical Consideration

The ethics committee of the Marmara University Health Science Institute approved the study. The Ethics Committee approval date and number are 1 March 2013- 4. The patients have signed an informed consent form.

Statistical Analyses

SPPS 20.0 (Statistical Package for Social Sciences, IBM, NY, USA) was used as the statistical package in the study. Content validity, structural validity, and criterion validity analyses were used for scale validity in the present study. Lawshe's technique was used for the content validity, and confirmatory factor analysis and explanatory factor analysis were used for the structural and criterion validity. Cronbach's alpha (analysis of internal consistency), item discrimination indices and test-retest technique were used for scale reliability.

Results

Sociodemographic Characteristics of Patients

The mean age of the 205 chronic hemodialysis patients included in the study was 52.55 ± 11.42 years. Of these patients, 88.2% were married, 52.1% were female, and 47.9% were male. Given the educational status, 54.1% were primary school graduates, 14.6% were secondary school graduates, 22.1% were high school graduates, and 9.2% were university graduates. The main cause of renal failure was diabetes mellitus in 31.7%, hypertension in 27.3%, diabetes, and hypertension in 23.4%, polycystic kidney in 13.1%, and various diseases in 4.5%. The patients' mean years of receiving dialysis were 0-5 years in 50.2%, 6-10 years in 27.3%, 11-15 years in 17.5%, and 16 years and above in 5%.

Validity Analyses

Content validity, structural validity, and criterion validity analyses were used for scale validity in the present study. The scales were sent to twelve experts for the content validity analysis. The answers from the experts were evaluated using Lawshe's

technique. The answers from the experts were evaluated by calculating the content validity ratio/index via Lawshe's technique for each item [10,11]. It was 0.56 for twelve experts based on the Lawshe's minimum content validity index. The scale draft was created since there was no item with a content validity index <0.56. Additionally, the items, which were expressed as problematic by the expert opinions, were revised in accordance with the suggestions. Considering that there might be unnoticed spelling, wording, or stylistic problems in the scale items; a pilot scheme was administered to 20 hemodialysis patients by the investigator. Since no problem was experienced during the pilot scheme, the methodological research proceeded with 205 chronic hemodialysis patients, which was almost seven times more than the scale's total number.

Structural Validity of the SPHHP

Confirmatory factor analysis was used for the structural validity of this scale. SPHHP consists of a single factor and ten items. In the first step, confirmatory factor analysis was applied to assess whether the 12-item structure was confirmed or not. The first confirmatory factor analysis examined the items with statistically insignificant t values. The items 11 and 12, which had insignificant t values based on this analysis, were removed from the scale. The analysis was repeated, and the t values of all remaining ten items were found significant [10]. A fit index was employed in the confirmatory factor analysis to assess the validity of the model. The values were $\chi^2=92.26$, $\chi^2/sd=2.64$, CFI=0.93, NNFI=0.91, and NFI=0.89. When the coefficients were examined, indicating the correlation association between the observed variables and factors of the model suggestive of the scale's factorial structure, it was concluded that all coefficients were sufficient. When considered the fit statistics calculated by the confirmatory factor analysis, it was concluded that the previously determined single-factor structure of the scale had a generally high level of fit with the collected data.

The explanatory factor analysis was applied, and the varimax rotation method was used to establish the structural validity of the SPHHP. Kaiser Meyer Olkin (KMO) and Bartlett tests were used to assess the adequacy of the data, and whether a factor analysis would be applied to the scale or not. KMO value was 0.77 and Bartlett test result was 613.8 ($p<0.001$). Based on these two results, the study sampling size was considered sufficient and adequate to apply a factor analysis.

The number of factors is decided using the eigenvalue coefficient. The present study did not limit the number of factors, and the factors with an eigenvalue > 1.00 were used taken into the scale. The eigenvalue was 3.8, and the variance was 31.8% for the first factor.

Structural Validity of the SCSHP

This scale consisted of 23 items. However, item 12 was found to reduce the reliability in the first explanatory factor analysis. The confirmatory factor analysis was applied to assess whether this was confirmed or not. Item 12, which had an insignificant t value, was removed from the scale. Accordingly, SCSHP was composed of 22 items. SCSHP consists of a single factor and 22 items. The first-level confirmatory factor analysis was applied for the structural validity of this scale. The fit indices were

$\chi^2=412.85$, $\chi^2/sd=1.98$, CFI=0.90, NNFI=0.89, and NFI=0.82. When the coefficients were examined, indicating the association between the observed variables and factors of the model suggestive of the scale's factorial structure, it was concluded that all coefficients were sufficient. When considering the fit statistics calculated by the confirmatory factor analysis, it was concluded that the previously determined single-factor structure of the scale generally had a high level of fit with the collected data.

The explanatory factor analysis was applied, and the varimax rotation method was used to establish the structural validity. KMO and Bartlett tests were used to assess the adequacy of the data, and whether a factor analysis would be applied to the scale or not. KMO value was 0.81, and the Bartlett test result was 1068.9 ($p<0.001$) for the SCSHP. Based on these two results, the study sampling size was considered sufficient and adequate to apply a factor analysis. The study did not limit the number of factors, and the factors with an eigenvalue > 1.00 were taken into the scale. The eigenvalue was 5.301, and the variance was 33% for the first factor.

Reliability Analyses of the SPHHP

Cronbach's alpha reliability coefficient was calculated for the scale's internal consistency and found to be 0.79. Accordingly, SPHHP has a high level of reliability. The Spearman-Brown coefficient was 0.72 and Guttman coefficient was 0.69. The range of 0.60-0.80 for this variable indicates a strong correlation [8]. A highly positive and significant correlation was found between the scores obtained from the SPHHP test-retest applications ($r=0.94$; $p<0.001$). Accordingly, as the scores from the first application increase, the scores from the second application increase. This result suggests that the scale is not affected by time and always measures the same even as time passes. When examining the total correlation for the adjusted items of the SPHHP, this value was found to be ranging from 0.177 to 0.540. Item analysis values of the SPHHP items are shown in Table 1.

Reliability Analyses of the SCSHP

Cronbach's alpha reliability coefficient was calculated for this scale's internal consistency and was found to be 0.83. Based on these results, the scale has a high level of reliability. The Spearman-Brown coefficient was 0.78 and Guttman coefficient was 0.78. The range of 0.60-0.80 for this variable indicates a strong correlation [8]. A highly positive and significant correlation was found between the scores obtained from the SCSHP test-retest applications ($r=0.96$; $p<0.001$). This result suggests that the scale is not affected by time and always measures the same; even as time passes [10]. The total correlation for the adjusted items of the SCSHP ranges from 0.320 to 0.605. Item analysis values of the SCSHP items are shown in Table 2.

Discussion

Validity of the SPHHP and SCSHP

Content validity, structural validity, and criterion validity analyses were used for scale validity in the present study. Lawshe's technique was used for content validity, and confirmatory factor analysis and explanatory factor analysis were used for the structural and criterion validity. Expert opinion was requested

Table 1. Item Analysis Values of the SPHHP Items (n=205)

Items	Correlation	Cronbach's Alpha
1. In general, my health is adversely affected by hemodialysis/my illness.	0.53	0.73
2. I am having troubles carrying out activities like climbing stairs, walking for 150-200 meters, dressing, or taking a bath.	0.46	0.74
3. I find it hard to find a caretaker when I need.	0.49	0.74
4. I am demoralized, and I feel pessimistic.	0.54	0.73
5. Hemodialysis/my illness affects my social life.	0.42	0.74
6. My psychological problems affect my social life.	0.54	0.74
7. Skipping even one session of dialysis has a negative effect on all aspects of my life.	0.33	0.75
8. Even one night of hospitalization has an adverse effect on me.	0.38	0.75
9. As the time I am in dialysis increases, my health is adversely affected.	0.33	0.76
10. In addition to my kidney disease, having additional chronic disease(s) has an adverse effect on all aspects of my life.	0.43	0.74

Table 2. Item Analysis Values of the SCSHP Items (n=205)

Items	Correlation	Cronbach's Alpha
1. Itching of the skin.	0.39	0.83
2. Fatigue	0.60	0.82
3. Spasms/contractions.	0.44	0.83
4. Nausea.	0.45	0.83
5. Palpitations.	0.56	0.82
6. Headaches.	0.47	0.82
7. Dizziness.	0.43	0.83
8. Joint pain/arthritis	0.44	0.83
9. Problems with fistula.	0.33	0.83
10. Chest and back pains.	0.44	0.83
11. Fever.	0.32	0.83
12. Numbness in the hands and feet.	0.30	0.84
13. Constipation.	0.42	0.83
14. Diarrhea.	0.48	0.82
15. Accumulation of fluid in the abdomen.	0.32	0.83
16. Changes in/loss of appetite.	0.32	0.83
17. Anxiety/being worried.	0.37	0.83
18. Nervousness.	0.54	0.82
19. Difficulty in paying attention/attention deficit.	0.37	0.83
20. Difficulty in maintaining sleep/insomnia.	0.40	0.83
21. Difficulties in social life.	0.41	0.83
22. Difficulties in family life.	0.36	0.83

for content validity. Confirmatory and explanatory factor analyses, varimax rotation method, KMO, and Barlett tests were used for the structural validity. Multiple fit indices are employed in the confirmatory factor analysis to assess the validity of the model. The most frequently used indices [13] include chi-square goodness (χ^2), root mean square error of approximation (RMSEA), comparative fit index (CFI), non-normed fit index (NNFI), normed fit index (NFI), goodness of fit index (GFI). The values observed in the scale model indicate a perfect fit if the values are $\chi^2/d < 3$; $0 < RMSEA < 0.05$; $0.97 \leq NNFI \leq 1$; $0.97 \leq CFI \leq 1$; $0.95 \leq GFI \leq 1$ and $0.95 \leq NFI \leq 1$; and acceptable fit if the val-

ues are $4 < \chi^2/d < 5$; $0.05 < RMSEA < 0.08$; $0.95 \leq NNFI \leq 0.97$; $0.95 \leq CFI \leq 0.97$; $0.90 \leq GFI \leq 0.95$ and $0.90 \leq NFI \leq 0.95$ [14]. When considering the fit statistics calculated by the confirmatory factor analysis in the present study, it was concluded that the single-factor structure of SPHHP and SCSHP generally had a high level of fit with the collected data. A factor loading value is a coefficient explaining the relationship of items with subdimensions. It is stated in the literature that factor loads ranging between 0.30 and 0.40 can be taken as the lower cut-off point when designing the factor pattern [15,16].

The lower cut-off point was set at 0.30 in this study. The variance of SPHHP was found to be 31.8%, and SCSHP was 33%. Reliability of the SPHHP and SCSHP

Cronbach's alpha reliability coefficient, item discrimination indices, and the test-retest technique were used for the reliability of the scales in the present study. Cronbach's alpha reliability coefficient was 0.79 and 0.83 for SPHHP and SCSHP, respectively, in the present study. Tezbaşaran (1997) states that a reliability coefficient, which may be considered sufficient, should be as close to 1 as possible in a Likert-type measurement tool. Numerical values ≥ 0.70 for Cronbach's alpha are sufficient in the newly developed measurement tools. Accordingly, both scales are reliable measurement tools at advanced levels.

The test-retest technique was administered to 40 patients one month after the start of the study. Based on the result of this analysis, the correlation coefficient was found significant to the highest degree for both scales.

Based on the analyses, it was concluded that SPHHP and SCSHP are valid and reliable measurement tools and could be used to assess the risks in hemodialysis patients. In conclusion, the higher scores from both scales indicate an increased level of risk for the patients.

Conclusions

The members of the health care team who spend the most time with hemodialysis patients are nurses, without any doubt. From this perspective, it is recommended to use SPHHP and SCSHP, which were developed with a holistic approach because there was an absence in the literature in hemodialysis centers in order to minimize patient risks and to plan and implement required nursing care based on the results.

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Conflict of interest:

The authors declare that they have no conflict of interest regarding the submission and publication of this manuscript.

Animal and human rights statements:

All procedures performed in studies involving human participants were in accordance with the ethical standards of the

institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. Informed consent was obtained from each participant that included into the study.

Competing interests

The authors declare that they have no competing interests.

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